



In this CVERA e-zine, we provide a brief overview of some of the recent work conducted by CVERA staff in collaboration with a wide range of national and international institutions. More in-depth information can be found at <http://www.ucd.ie/cvera/>, noting the role of CVERA to provide high quality independent scientific research and advice to support national evidence-based policy-making in animal health & welfare and public health and related matters.

COVID-19 work

Since the start of the COVID-19 pandemic, CVERA colleagues have contributed to the work of the IEMAG (Irish Epidemiological Modelling Advisory Group), one of the 9 subgroups of the National Public Health Emergency Team (NPHE). IEMAG provides advice and expertise in support of national decision-making in the area of epidemiological data and modelling. This support has reduced substantially in recent months, but continues particularly in the area of spatial analysis. Several scientific papers have been published in support of this work, mainly in relation to estimates of epidemiological parameters, including:

Byrne et al., *BMJ Open* 10, e039856 (infectious period duration; [10.1136/bmjopen-2020-039856](https://doi.org/10.1136/bmjopen-2020-039856)),

McAloon et al., *BMJ Open* 10, e039652 (incubation period, [10.1136/bmjopen-2020-039652](https://doi.org/10.1136/bmjopen-2020-039652)),

Griffin et al. *BMJ Open*, in press (generation time, serial interval) and

Häsler et al. *Frontiers in Veterinary Science*, in press (One Health in action, [10.3389/fvets.2020.578649/abstract](https://doi.org/10.3389/fvets.2020.578649/abstract)).

Modelling forum

The first of an ongoing series of six-monthly meetings for those involved in modelling livestock diseases in Ireland took place on 28th September. Presentations were given by researchers at UCD, UCC, UFZ (Leipzig, Germany), Oniris (Nantes, France) and the University of Limerick. We expect that these meetings will foster collaboration amongst these groups as well as between them and DAFM/AHI.

Managing herd risk in the national bTB eradication programme

In recent weeks, there has been renewed interest in risk-based approaches to managing bovine TB, as part of the national programme. In particular, the TB herd history risk statement and report generated considerable debate in the national rural media letters. As part of this discussion, Simon More wrote two articles in the *Irish Farmers Journal*, including [‘TB risk categories ‘next logical step’ to eradication’](#) and [‘Lessons to learn on TB eradication from Australia and NZ’](#).

Spatial and network characteristics of Irish cattle movements

This study by Tratalos et al. examined the spatial and network characteristics of cattle movements between herds in the Republic of Ireland (ROI), to inform policy and research of relevance to the surveillance and management of disease in Irish cattle. The distances moved away from the herd were on average greater for herds in the west of ROI whereas distances moved to a herd were generally greater for destinations in the centre-east and the north-west. Approximately half of transfers were conducted within a single county, but the number and distance of between county movements varied considerably by county of origin and county of destination, with the proportion of moves completed within a single county correlated with its size. Herds exchanging cattle via a market were generally further apart than when moves were made directly herd to herd. Some herds took part in a relatively large number of movements whilst also retaining their cattle for long periods

(> 100 days) between moves. Mart moves resulted in longer range displacements than those directly from farm to farm. The frequency distributions of a variety of herd-level movement metrics were heavily right skewed but, in contrast to similar studies, were not found to follow a power law. Different measures of the amount of movement experienced by a herd were often poorly correlated. The paper is available at *Preventive Veterinary Medicine* 183, 105095, [10.1016/j.prevetmed.2020.105095](https://doi.org/10.1016/j.prevetmed.2020.105095).

Further to the above study, a follow-on project will examine the relationship between network derived cattle movement metrics and TB.

Raw milk cheese produced from *M. bovis* infected herds: what is the risk?

The recent rise in consumer demand for speciality cheeses, which are often produced using raw milk, and the persistence of *M. bovis* in Irish cattle herds has highlighted the potential risk of human *Mycobacterium bovis* (bTB) infection from consuming cheese produced from raw milk from bTB infected herds. Currently, published data quantifying this risk is lacking. Hence, the aim of this study which is being led by Áine Collins is to develop a risk assessment method to estimate the risk of human bTB infection from consuming cheese produced from raw milk originating in bTB infected herds.

***Mycobacterium bovis* genomics reveals transmission of infection between cattle and deer in Ireland**

Research conducted by Crispell et al. used whole-genome sequencing of *M. bovis* sourced from infected cattle, deer and badgers in County Wicklow to evaluate whether the epidemiological role of deer could have shifted from spillover host to source. The analyses reveal that cattle and deer share highly similar *M. bovis* strains, suggesting that transmission between these species is occurring in the area. In addition, the high level of diversity observed in the sampled deer population suggests deer may be acting as a source of infection for local cattle populations. These findings have important implications for the control and ultimate eradication of bTB in Ireland. For the full study, see *Microbial Genomics* 6, 8, [10.1099/mgen.0.000388](https://doi.org/10.1099/mgen.0.000388).

Risk factors for African swine fever incursion in Romanian domestic farms during 2019

The spread of African swine fever (ASF) has continued across Europe, most recently with the incursion of ASF into Germany. As a member of the ASF working group in the European Food Safety Authority (EFSA), Simon More contributes to ongoing work in support of decision-making on this issue in the European Commission. In most affected member states, the wild boar-habitat cycle has dominated ASF spread, with occasional spillover to domestic farms. In Romania, in contrast, there have been many outbreaks in domestic farms, primarily with low levels of biosecurity, and relatively few cases in wild boar. This study investigated possible risk factors for ASF incursion in commercial and backyard pig farms in Romania. A number of factors were found to be important, relating to herd size, to exposure from other outbreak farms and cases in wild boar, and to human activity and management. The paper by Boklund et al. is available in *Scientific Reports* 10, 10215, [10.1038/s41598-020-66381-3](https://doi.org/10.1038/s41598-020-66381-3).

Epidemiology of age-dependent prevalence of Bovine Herpes Virus Type 1 (BoHV-1) in dairy herds with and without vaccination

A national programme to control BoHV-1 does not currently exist in Ireland but is under active discussion. In collaboration with the Helmholtz Centre for Environmental Research in Germany, Animal Health Ireland (AHI) is developing age-structured epidemiological models to support consideration of possible control or eradication options. In support of this work, there is a need for an understanding of the age-related dynamics of BoHV-1 seroprevalence in seasonal calving Irish dairy herds. This paper by Brock et al., which introduces the concept of age-threshold cohorts, is published in *Veterinary Research* 51, 124, [10.1186/s13567-020-00842-5](https://doi.org/10.1186/s13567-020-00842-5).

Johne's disease in Irish dairy herds: considerations for an effective national control programme

Over the last 10 years, there has been detailed discussion in support of an effective national Johne's disease control programme. This paper provides an overview of this discussion, and of the conclusions drawn. The discussion was

supported by a narrative review of the scientific literature on the epidemiology of Johne's disease and of selected control programmes throughout the world. Further, two modelling studies specifically commissioned to assess testing methods used to demonstrate confidence of freedom in herds and to evaluate a range of possible surveillance strategies provided additional information. The paper provides a rationale for the inclusion of a Veterinary Risk Assessment and Management Plan (VRAMP), including voluntary whole herd testing to identify infected herds and to support assurance-based trading through repeated rounds of negative testing, national surveillance for herd-level case-detection, and improved understanding of biosecurity management practices. The paper by Jordan et al. is available in the *Irish Veterinary Journal* 73, 18, [10.1186/s13620-020-00166-y](https://doi.org/10.1186/s13620-020-00166-y).

Other recently published papers which CVERA staff contributed to

Byrne, A.W., Barrett, D., Breslin, P., Madden, J.M., O'Keeffe, J., Ryan, E., 2020. Post-mortem surveillance of bovine tuberculosis in Ireland: herd-level variation in the probability of herds disclosed with lesions at routine slaughter to have skin test reactors at follow-up test. *Veterinary Research Communications* 44, 131-136. [10.1007/s11259-020-09777-w](https://doi.org/10.1007/s11259-020-09777-w)

Byrne, A.W., Barrett, D., Breslin, P., Madden, J.M., O'Keeffe, J., Ryan, E., 2020. Bovine tuberculosis (*Mycobacterium bovis*) outbreak duration in cattle herds in Ireland: a retrospective observational study. *Pathogens* 9, 815. [10.3390/pathogens9100815](https://doi.org/10.3390/pathogens9100815)

Kęsik-Maliszewska, J., Collins, Á.B., Rola, J., Blanco-Penedo, I., Larska, M., 2020. Schmallenberg virus in Poland endemic or re-emerging? A six-year serosurvey. *Transboundary and Emerging Diseases* (in press). [10.1111/tbed.13870](https://doi.org/10.1111/tbed.13870)

Martin, H., Manzanilla, E.G., More, S.J., O'Neill, L., Bradford, L., McAloon, C.I., Collins, Á.B., McAloon, C.G., 2020. Current antimicrobial use in farm animals in the Republic of Ireland. *Irish Veterinary Journal* 73, 11. [10.1186/s13620-020-00165-z](https://doi.org/10.1186/s13620-020-00165-z)

McAloon, C.G., O'Grady, L., Botaro, B., More, S.J., Doherty, M., Whyte, P., Nielsen, S.S., Citer, L., Kenny, K., Graham, D., Green, M., 2020. Individual and herd-level milk ELISA

test status for Johne's disease in Ireland after correcting for non-disease-associated variables. *Journal of Dairy Science* 103, 9345-9354. [10.3168/jds.2019-18018](https://doi.org/10.3168/jds.2019-18018)

McFarland, L., Macken-Walsh, Á., Claydon, G., Casey, M., Douglass, A., McGrath, G., McAloon, C.G., 2020. Irish dairy farmers' engagement with animal health surveillance services: Factors influencing sample submission. *Journal of Dairy Science* (in press). [10.3168/jds.2019-17889](https://doi.org/10.3168/jds.2019-17889)

van Roon, A.M., Mercat, M., van Schaik, G., Nielen, M., Graham, D.A., More, S.J., Guelbenzu-Gonzalo, M., Fourichon, C., Madouasse, A., Santman-Berends, I.M.G.A., 2020. Quantification of risk factors for bovine viral diarrhoea virus in cattle herds: A systematic search and meta-analysis of observational studies. *Journal of Dairy Science* 103, 9446-9463. [10.3168/jds.2020-18193](https://doi.org/10.3168/jds.2020-18193)

Yatabe, T., Martínez-López, B., Díaz Cao, J.M., Geoghegan, F., Ruane, N.M., Morrissey, T., McManus, C., Hill, A.E., More, S.J., 2020. Data-driven network modelling as a framework to evaluate the transmission of piscine myocarditis virus (PMCV) in the Irish farmed Atlantic salmon population and the impact of different mitigation measures. *Frontiers in Veterinary Science* 7, 385. [10.3389/fvets.2020.00385](https://doi.org/10.3389/fvets.2020.00385)

Recent news items, can be found at:

<http://www.ucd.ie/cvera/news/>

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